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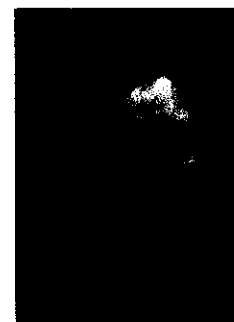
IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN MARIANA ISLANDS

MOSES T. FEJERAN and
QIANYAN S. FEJERAN,

Plaintiffs,
vs. Civil Action No. 05-0033

AVIATION SERVICES (CNMI), LTD.
d.b.a. FREEDOM AIR,

Defendant.



DEPOSITION OF RICHARD T. GILL, Ph.D.
Taken on behalf of the Plaintiffs
June 28, 2007

- - -

BE IT REMEMBERED THAT, pursuant to the Oregon Rules of Civil Procedure, the deposition of RICHARD T. GILL, Ph.D., was taken before Marta J. Charles, a Professional Court Reporter and a Notary Public for the State of Oregon, on June 28, 2007, commencing at the hour of 11:59 A.M., the proceedings being reported at 8235 Northeast Airport Way, Portland, Oregon.

<p style="text-align: right;">Page 17</p> <p>1 A. Well, in any setting, whether it's a 2 commercial building or private residence, an industrial 3 setting, a vessel, an aircraft, what I would look at 4 are the general design guidelines that exist for kind 5 of the basic foundation of what an ideal set of 6 stairways would be. And then, you look at that in 7 comparison to those to make a determination of how 8 you stack up to what the general goal should be. 9 And you can look at things like Uniform Building 10 Code, International Building Code, International 11 Resident Code, MIL Standard 1472. I don't know that 12 OSHA specifically has things in steps, but I would 13 look into that. Occasionally, you'll find things in 14 OSHA that are related to that. And you'll find that 15 any of those various standards vary from year to year 16 and vary amongst themselves; so vary within as well 17 as between. 18 Q. Do you have a specific memory whether, in 19 that particular case, dealing with the stairway of the 20 light -- the aircraft -- you used in looking at the 21 design of the stairs whether they were safe or not, 22 you used the UBC; Uniform Building Code? 23 A. What I would say is, I would use all of 24 those as far as a general understanding of the goal 25 of what you should try to move towards are the</p>	<p style="text-align: right;">Page 19</p> <p>1 "Hey. Somebody else designed this. It ain't my 2 problem," to use the vernacular? 3 A. If I could just clarify your question. I'm 4 not here to offer legal opinions. 5 Q. I understand. 6 A. Okay. So rather than saying, "defense," 7 what I would say is, from a safety perspective or as 8 a safety engineer, you have to look at the 9 constraints of the world we operate within. And at 10 issue that I think is important in this case is the 11 owner/operator of the aircraft, in this case Freedom 12 Air, is not at liberty as I understand the FAA, to 13 modify any of the infrastructure associated with the 14 aircraft. Whereas, if I buy a building and a 15 building was designed and built a number of years ago 16 and I see an issue that perhaps I want to alter, 17 that's an entirely different set of constraints that 18 I'm facing. 19 Q. Do you have any specific knowledge, or are 20 you -- what's your -- what's the basis of your 21 knowledge when you say that the FAA, in effect, won't 22 -- would not allow Freedom Air to make changes to 23 this stairway? 24 A. My understanding of the FAA, from the work 25 that I've done over the years, is that in order to</p>
<p style="text-align: right;">Page 18</p> <p>1 general principles. And they're essentially the same 2 across all of those. They don't specifically and 3 directly apply in a maritime setting or in an 4 aircraft setting or even in some industrial settings. 5 But at least it gives you a starting point to say, 6 "Knowing what we know about human biomechanics, what's 7 the ideal design geometry for a stairway?" 8 Q. Okay. So is it fair to say that it's 9 appropriate to use as a guideline, if not an actual 10 standard Uniform Building Code, in looking at stairs 11 for an aircraft? 12 A. If you're looking at the design or 13 manufacture of the stairs as opposed to the use or 14 maintenance of the stairs, yes, I think that's a 15 reasonable thing to do. You don't -- They don't 16 obviously apply in a -- in terms of, you have to 17 meet the Uniform Building Code. It just simply is a 18 starting point to say, "Knowing what we know about 19 human biomechanics, these are the general design 20 geometries that one should try to achieve." 21 Q. Now, you've mentioned a couple times about 22 the difference between design and someone who's 23 actually using it or maintaining it. In your 24 opinion, is an owner -- whether it's a vessel or a 25 building -- in your opinion, is it a defense to say,</p>	<p style="text-align: right;">Page 20</p> <p>1 sell an aircraft and operate it in a commercial 2 setting, there's a rigorous set of requirements that 3 the FAA imposes on you. And you have to meet those 4 in order to sell that aircraft. And then, the basic 5 infrastructure of that aircraft cannot be modified, 6 and the basic OEM maintenance protocol must be 7 complied with. 8 Q. Now, you used the word "infrastructure." 9 I'm using the -- the word "stairs." I understand 10 "infrastructure" is a -- is much broader, but I'm 11 asking more specifically. Is it your understanding 12 that the FA -- if Freedom Air wanted to make any 13 changes to these stairs to make them safer, the FAA 14 would stop them? 15 A. I think rather than saying, "the FAA would 16 stop them," the way I would phrase it is, it's my 17 understanding that that's not conforming with the FAA 18 requirements. In other words, you can't go in -- 19 my understanding -- and unbolt the handrail and 20 redesign a new handrail and bolt it on and undo all 21 the stair treads and put different stair treads on 22 with different spacing and change welds and bolts. 23 That kind of structural change, I -- my understanding 24 is, you cannot do on an aircraft. 25 Q. Okay. But do you have any specific FAA</p>

5 (Pages 17 to 20)

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<p style="text-align: right;">Page 21</p> <p>1 regulation that you can point me to, or is this just 2 kind of -- yeah -- is there any specific FAA 3 regulation you can say, "Look. Here's the regulation. 4 They cannot make this change?" 5 A. No. I didn't -- have not gone to the 6 literature and looked. 7 THE WITNESS: And if we can just 8 take a brief break here, I notice the court reporter 9 had dropped her writing utensil. 10 (Whereupon, a short break was 11 taken.) 12 MR. BANES: We're back on record. 13 BY MR. BANES: (Continuing) 14 Q. Is there any part of your testimony -- I 15 know that you had a chance to meet with Freedom Air's 16 lawyer. Is there any part of your testimony you'd 17 like to change, correct, or modify? 18 A. Just to expand, I think would be the proper 19 word. And that is, in our discussions this morning, 20 the name Richard Brown had come up. And I believe 21 he's director of operations and safety at Freedom Air. 22 And through discussions that Mr. Ledger has had with 23 Mr. Brown, Mr. Brown's communication to Mr. Ledger are 24 consistent with my understanding, and that is that the 25 FAA would not allow them to go through and design,</p>	<p style="text-align: right;">Page 23</p> <p>1 of it because there was allegations of falling through 2 the handrail. 3 Q. Well, how could -- how could there be a 4 design defect if -- if the airline could then say, 5 "Well, look, we can't make any change because we are 6 FAA regulated, and so, we can have an unsafe 7 stairway, and there's nothing you can do about it?" 8 A. I don't understand your question. 9 Q. Well, you gave an opinion in the other case 10 that the stairway was unsafe, in part because of a 11 coding problem, but also issues related to variations 12 in riser and treads, if I understood you correctly. 13 A. Correct. 14 Q. So how is that -- how is that situation 15 different than the present situation? 16 A. Well, I think there are similarities. But, 17 again, the issue at hand is that it's a manufacturing 18 design issue. It's not the air carrier issue. In 19 other words, the issue that I had in that case and 20 is an issue, I believe in part in this case, is that 21 these stairways, in either case, could have been 22 designed safer. Now, obviously, there are constraints 23 that have to be dealt with, but they could've been 24 designed safer. So the point of contention that I 25 have is more with the manufacturer than something to</p>
<p style="text-align: right;">Page 22</p> <p>1 modify, or install a new set of stairways. But I 2 can't cite you to a specific FAA regulation statute. 3 Q. Okay. So you're relying on a statement by 4 an employee of Defendant Freedom Air -- communicated 5 through their lawyer to you? 6 A. I would say that corroborates my prior 7 understanding. 8 Q. Going back to this case in which you gave a 9 general opinion of the design of the stairway was not 10 safe, what was not safe about the stairway -- that 11 particular stairway? 12 A. There were a number of issues. But the one 13 that was most prevalent was it had aluminum 14 slip-resistant tread nosings with an abrasive grip 15 coating on them, and that had not been maintained in 16 a safe condition. And the -- Based on the frequency 17 in which it was alleged to be replaced was either a 18 design or a manufacturing defect, because it was only 19 lasting a matter of a few days before large pieces 20 were coming off. And then, it was a number of 21 issues pertaining to general stairway geometry, again. 22 Q. Like what? 23 A. Rise run ratios, rise run heights and riser 24 heights, tread depths. There was an issue of the 25 handrail allowing somebody to fall through the center</p>	<p style="text-align: right;">Page 24</p> <p>1 do with the manner in which the -- the aircraft is 2 being operated. 3 Q. Was the carrier also a party to the design 4 defect stairway case that we were talking about? 5 A. They were the original party, is my 6 recollection. And when I looked at the aircraft and 7 the steps and gave my preliminary opinions back to 8 the attorney, they then brought in -- the plaintiff 9 brought in the airframe manufacturer. 10 Q. Is there anywhere in your report in which 11 you state that -- in effect, that these stairways 12 cannot be changed pursuant to FAA regulation? 13 A. I don't believe I went into that level of 14 detail. No, sir. 15 Q. Did -- During Applied Cognitive Science's 16 inspection of Freedom Air's stairway, did it consider 17 the feasibility of making any changes to make the 18 stairway safer? 19 A. No. That was really beyond the scope of 20 anything that we were asked to do. 21 Q. What was the ultimate resolution of the case 22 in which you -- you gave an opinion saying the 23 stairway in the aircraft was unsafe? Was it settled? 24 Did it go to trial? 25 A. I think it's still an open-case file.</p>

6 (Pages 21 to 24)

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<p style="text-align: right;">Page 25</p> <p>1 Q. Did -- did you, Applied Cognitive Sciences, 2 come to any conclusion as to whether the Freedom Air 3 stairs were or were not safe? 4 A. I think safety, you've got to understand, is 5 on a continuum. It's not discrete, like your 6 question was phrased; "safe or unsafe." 7 Having said that, I think there are 8 things about the way they are designed that, in my 9 opinion from a safety perspective, the design, 10 starting from ground zero, could be altered and make 11 them safer. There are certain constraints within the 12 design that you have no control over. 13 Q. Now, as part of your report, you reviewed 14 Dr. Perez' report, right? 15 A. That's correct. 16 Q. Did -- Well, let me ask a foundational 17 question first. Did you measure the treads and the 18 riser heights of the stairways? 19 A. My associate engineer -- 20 Q. Right. I meant -- 21 A. -- Joellen did. 22 Q. -- "you" -- applied in the broad sense. 23 A. I apologize. I know you said 24 that at the beginning of the deposition. It's just 25 unusual for me to have a deposition of the company</p>	<p style="text-align: right;">Page 27</p> <p>1 A. If I could rephrase your question -- 2 Q. Sure. 3 A. -- and eliminate "conclusions," because 4 conclusions are broader to me. 5 Q. All right. 6 A. I think I understand what you're trying to 7 get at. In general, two people measure two things at 8 two different points in time, two different locations, 9 you're going to get variability. 10 Having said that, there was nothing 11 dramatically different between the measurements that I 12 saw. 13 Q. Did Applied Cognitive Sciences perform any 14 other tests other than measuring the riser height, the 15 tread width, and the handrail? 16 A. Riser height and tread depth, and also the 17 slope of the treads -- 18 Q. Right. 19 A. -- and then, handrail dimensions and handrail 20 deviation. Those are the only measurements. 21 Q. What about the width of the stairway? 22 A. I don't believe -- Let me double-check. I 23 don't believe that was measured. No, sir. 24 Q. Location and width of nonskid strips? 25 A. They were photographed, but not specifically</p>
<p style="text-align: right;">Page 26</p> <p>1 rather than me personally, if you will, in the nature 2 of your questions that you're asking. 3 But having said that, yes, my 4 associate did measure those. 5 Q. Okay. Well, why don't we start, actually, 6 with a little bit broader -- what tests or 7 measurements were taken of the Freedom Air's stairway? 8 And when I say "the Freedom Air stairway," you 9 understand what I'm talking about, right, the stairway 10 that's the subject of this lawsuit? 11 A. Right. Thank you for that clarification. 12 Yes, I -- That's what I understood the question to 13 be. Basic, what I would call "tread geometry 14 measurements," or "stairway geometry measurements," 15 which would be riser height, tread depth, handrail 16 dimensions, handrail height, the slope of the treads, 17 since it was an issue that had been raised, the 18 amount of deflection that was possible in the 19 handrail. I believe that was it. 20 Q. Okay. Did Applied Cognitive Science's 21 measurements of the variation in tread and riser 22 heights -- the variance -- did they correlate with 23 Dr. Perez' conclusions? In other words, did you come 24 up with different conclusions as to the -- just the 25 measurements?</p>	<p style="text-align: right;">Page 28</p> <p>1 measured, because the treads were nonskid as well. 2 It was rubberized tread coating. 3 Q. Any measurement of coefficient friction or 4 slip resistance of the stair's surfaces? 5 A. No, sir. No reason to. There's no -- no 6 reason to believe that's an issue in this case and no 7 reason to believe that they're not slip resistant. 8 Q. And did -- I've got to get a little more 9 specific here. Did you, Applied Cognitive Sciences, 10 measure the riser height of each individual stair? 11 A. That's correct. Each "tread" is what we 12 would refer to them as. 13 Q. And do you have your field notes or your 14 measurements? Would you compare them to Dr. Perez' 15 report? Because you said there's no significant 16 variation, but I just want to see if there's any 17 variation. 18 A. There is variation. Let me pull up his 19 report. I just had it here. As I recall, the most 20 significant variation was in tread depths, or "run" is 21 another term you'll hear for that. I don't know how 22 you want me to do this. Do you want me to go 23 through number by number and tell you what the 24 numbers are? Is that what you would like? 25 Q. Yes. For instance, if we could take the</p>

7 (Pages 25 to 28)

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Page 29

1 first riser. Dr. Perez measured it at 9 and 7/16ths.
2 A. Okay. And the riser height that we have is
3 9 inches.

4 Q. Really?

5 A. That's correct.

6 MR. LEDGER: What are you referring
7 to? Do you have field notes there?

8 THE WITNESS: I'm referring to
9 comparing Dr. Perez's report with my understanding of
10 what he means by the order in which his numbers are
11 written with what our numbers are.

12 MR. LEDGER: Okay. Thanks.

13 BY MR. BANES: (Continuing)

14 Q. And Dr. Perez says the second one is 9 and
15 1/8th?

16 A. Correct.

17 Q. 9 and 3/16ths?

18 A. Correct, for his third measurement for riser
19 height.

20 Q. You had the same?

21 A. On the second riser height, we have 9 and
22 1/8ths --

23 Q. Right.

24 A. -- the same identical number. On the third
25 riser height, we have 9 and 1/8th, so we differ by a

Page 30

1 16th of an inch.

2 Q. And the last one he has is 10 and 1/8th?

3 A. And we have 10 and one quarter.

4 Q. And he has -- the three treads were measured
5 at 7 and 1/2?

6 A. Correct.

7 Q. 8 and one quarter?

8 A. That's correct.

9 Q. And 8 and one quarter?

10 A. That's correct.

11 Q. So, the variation -- Let's see, if your
12 variation between the third step and, in effect, what
13 Dr. Perez is calling the fourth step, your variation
14 is actually larger; 9 and 1/8th to 10 and a quarter
15 versus his 9 and 3/16ths and 10 and 1/8th?

16 A. That's correct.

17 Q. Okay. So it's a little bit more than an
18 inch?

19 A. At the time that we measured it, that is
20 correct.

21 Q. Okay. And is it -- is it fair to say that
22 variation in -- in riser heights can make stairs
23 unsafe?

24 A. Depends on the circumstances. But, yes, it
25 can.

Page 31

1 Q. Okay. What would -- what circumstances
2 would make riser -- variation of riser height of,
3 say, an inch, safe?

4 A. Safe or unsafe?

5 Q. Make it safe.

6 A. It's in a situation where a couple things
7 can happen. One is, if you have not had enough of
8 ability to develop an internalized cadence for the
9 stairway geometry, then that variation would be of no
10 significance to you.

11 Another case is, on the last step
12 onto the -- the lower surface, often times you will
13 encounter variability there. And I think a good way
14 to describe that is if you imagine a set of steps
15 coming down from a building into a slopping sidewalk,
16 depending on where you are on the width of that step
17 as it interfaces with the sloping sidewalk, you
18 realize your internal model -- your schema is that
19 when I step off this last step, I expect the height
20 to be different because I can't do anything about the
21 fact that, in this case, the ground slopes.

22 Q. Right.

23 A. Well, in a situation such as this where you
24 have a set of folding steps that come out of a
25 movable object, you don't expect the last step between

Page 32

1 the step and the tarmac, something that is aluminum
2 and attached to the airframe versus something that's
3 solid ground, that you don't internalize that to be
4 the same as the rest of the steps. And -- and, in
5 fact, from an engineering perspective, it -- I don't
6 know of any way that you can possibly control that
7 height. You'd have it controlled within certain
8 limits, perhaps, but you can't specifically control
9 that elevation.

10 Q. Okay. But what about the variation between
11 the -- the -- the other risers?

12 A. Well, the variations that we measured and
13 the variations that Dr. Perez measured fall within the
14 general guideline principles that you try to achieve.
15 That is, you try to keep within 3/8ths of an inch.
16 And so, if you exclude that last step onto the
17 tarmac, our variation is an 8th of an inch. And if
18 I look at Dr. Perez's, it looks like he's got 5/16ths,
19 which is not quite 3/8ths of an inch.

20 Q. What about the varia -- So, just so I
21 understand. Is it your opinion that Freedom Air
22 stairs are reasonably safe despite the variation in
23 treads and -- and riser heights?

24 A. Well, again, it's not a continuum. But what
25 I would say is that Short's -- the SD3-60 steps --

8 (Pages 29 to 32)

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<p style="text-align: right;">Page 33</p> <p>1 could've been designed safer. It's not Freedom Air's 2 steps; it's Short's steps. 3 Q. Short was the manufacture? 4 A. That's my understanding, is that they were 5 the designer manufacturer of the airframe. 6 Q. Do you know when this -- when the aircraft 7 was manufactured? 8 A. No, sir, I didn't look into that. 9 Q. And is that the full name of the company; 10 Short Manufacturer? 11 A. I can't tell you that that's the full name, 12 no, sir. I have a manual I believe -- says "Short's 13 SD3-60." 14 Q. So how could these stairs have been designed 15 to be safer? 16 Q. Well, if you go to an ivory-tower world, if 17 you will, and ignore the fact that it's on an 18 airframe, ideally what you'd like to see are riser 19 heights that are 7 inches, preferably less; tread 20 depths that are all 11 inches, preferably more. 21 You'd like to see handrails both sides with horizontal 22 extensions, top and bottom, with the handrails 23 returning to a solid object so that there's no 24 openings. The maximum opening on either side of the 25 -- or the maximum opening under the handrail a 4-inch</p>	<p style="text-align: right;">Page 35</p> <p>1 ratio. Excuse me. So then, a sudden disruption in 2 that ratio would be more significant if you've gone 3 down ten steps than if you've gone down five or six. 4 Q. I guess what I'm getting at is, are three- 5 step risers -- three-step stairs at high risk? 6 A. Well, I wouldn't use the phrase "high risk" 7 in a vacuum. What I would tell you is, for example, 8 the American Society of Testing and Materials 9 Standard, F-1637, recommends that you don't have steps 10 that have three or fewer risers. So that would 11 include three, but it's because it's too few of 12 risers, not because it's too many of risers. 13 Q. Right. But what -- Why is that? I mean, 14 why do they recommend not having three-step risers? 15 A. Three or fewer. 16 Q. Right. 17 A. The reason is, people don't reliably detect 18 them and they do what we call "air walk." They're 19 on an upper elevation, they're walking to go 20 somewhere, and they don't realize that there is an 21 intervening step or two steps or three steps. And 22 so, they step out expecting there to be a surface to 23 step onto; in fact, they step into thin air. That's 24 why that recommendation. 25 Q. So I -- As I understand it, if we were just</p>
<p style="text-align: right;">Page 34</p> <p>1 sphere should not fit through. The width of the 2 stairs should be at least 36 inches. Those are the 3 kinds of things in the ideal world that you would try 4 to achieve. 5 Q. What about that these are, in effect, 6 three-step or four-step risers? Is there anything 7 about the -- let me take that as a -- Is there 8 anything that makes stairs that are just two to four 9 risers -- treads -- risers, right? Risers. I'm 10 getting myself all confused here -- two to four steps 11 more dangerous than steps that are longer? 12 A. Let me see if I can address that. What I 13 understand your question to be: Is there an issue 14 that relates safety to number of risers? 15 Q. Right. 16 A. A couple things. The more risers you have, 17 such as an entire flight of steps from one floor to 18 another in a building is typically 12 or 13 risers. 19 If you do that in one single run, then you have a 20 greater fall height. You have a chance to tire 21 people that are in less physical, able condition. If 22 you have unprotected sides, you have a greater 23 potential fall height. If you have a longer series 24 of steps, then you have the chance to develop the 25 cadence and an internalized schema for the rise run</p>	<p style="text-align: right;">Page 36</p> <p>1 talking about rise -- I'm sorry -- if we were just 2 talking about design, you would agree that the 3 variation in riser height and the treads and the lack 4 of handrail makes these stairs not safe? 5 A. No. Again, I think that's an over- 6 representation of what I'm saying. I gave you some 7 design geometry parameters -- 8 Q. Right. 9 A. -- and that's from the general guidelines of 10 what you want to try to achieve. If I take what you 11 just said, of variation in riser height, for example 12 -- which I know Dr. Perez talks about -- if we 13 exclude the last step down, which I think should be 14 excluded for a number of reasons -- but if we exclude 15 that last one down, there is no disruption in the 16 variation of riser height; either his measurements or 17 mine. And the reason I say "exclude that last step 18 down" is, again, your internalized schema is, you 19 anticipate the difference of elevation on the last 20 step. 21 And secondly, from an engineering 22 standpoint, I don't know how you can possibly control 23 the elevation of the last step within the degrees of 24 tolerances that we're talking about. 25 Q. What about treads?</p>

9 (Pages 33 to 36)

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